

KOLESNIKOVA, N.I.; ARBUZOV, S.V.

Rapid (semihot) method for leather tanning at raised temperatures  
and the results of its use. Nauch.-issl. trudy TSNIKP no.33:  
7-14 '63 (MIRA 18:1)

METELKIN, A.I.; KOLESNIKOVA, N.I.

Introduction of new production methods and materials in tanning.  
Biul. tekhn.-ekon. inform. Gos. nauch.-issl. inst. nauch. i tekhn.  
inform. 17 no.12:41-43 D '64. (MIRA 18:3)

*by means of*  
KOLESHNIKOVA, N. K. Cand Med Sci -- (diss) "On the Ayakkalkanskiy mineral-water  
treatment of patients with chronic liver and biliary <sup>ous</sup> tract diseases." Alma-Ata,  
1956. 16 pp 22 cm. (Inst of Physiology, Inst of Clinical and Experimental Surgery,  
and Inst of Marginal Pathology, Acad Sci Kazakh SSR), 100 copies  
(KL, 7-57, 109)

70

KOLESNIKOVA, N.K.

Treating chronic diseases of the liver and biliary tract with Ayak-Kalkan mineral water. Zdrav.Kazakh. 16 no.11:18-27 '56. (MLR 10:1)

1. Iz Instituta klinicheskoy i eksperimental'noy khirurgii (direktor akademik Akademii KazSSR A.N.Syrganov) Akademii nauk Kazakhskoy SSR  
(AIMA-ATA PROVINCE--MINERAL WATERS)  
(BILIOUS DISEASES AND BILIOUSNESS)

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000723820005-4

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000723820005-4"

KOLESNIKOVA, N.K. (Alma-Ata)

Development of physical therapy in Kazakhstan. Vop. kur.,  
fizioter. i lech. fiz. kult., 28 no.5:467-468 S-G '83.  
(MIRA 17:9)

KOLESNIKOVA, N.K.

All-Union Conference of Physical Therapists and Health Resort  
Specialists. Zdrav. Kazakh. 18 no. 2:58-64 '58. (MIRA 13:8)  
(THERAPEUTICS, PHYSIOLOGICAL—CONGRESSES)

ACC NR: AP7010727

SOURCE CODE: UR/0189/66/000/003/0067/0070

AUTHOR: Kolesnikova, N. M.; Iofa, B. Z.

ORG: Department of Radiochemistry, Moscow State University (Kafedra radiokhimii Moskovskogo gosudarstvennogo universiteta)

TITLE: Investigation of the state of selenium (IV) in hydrochloric acid solutions

SOURCE: Moscow. Universitet. Vestnik. Seriya II. Khimiya, no. 3, 1966, 67-70

TOPIC TAGS: spectrophotometric analysis, selenium compound, hydrochloric acid, spectrophotometer /SF-4 quartz spectrophotometer

SUB CODE: 07,14

ABSTRACT: A spectrophotometric investigation is presented on the state of selenium(IV) at a temperature of  $18 \pm 3^\circ$  in hydrochloric acid solutions. Absorption spectra were measured on a SF-4 quartz spectrophotometer, where cells with the following thicknesses of absorbing layer were used: 0.1, 0.2 and 10 mm. Selenium (IV) solutions were prepared by dissolving selenium dioxide in 12 N HCl or by chlorination of black metallic selenium in 12 NHCl. In the latter case,  $\text{SeCl}_4$  was first obtained, and subsequently dissolved in acid. Both methods of preparing the

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UDC: 546:23:535:313,535.399



ACC NR: AP7010727

solutions lead to identical results, however the time to reach equilibrium differs. Thus, when  $\text{SeO}_2$  was dissolved in 12M HCl, equilibrium was established in seven days, while in the latter case in one day. The absorption maximum at  $310 \pm 3$  microns can relate to the complex ion  $\text{SeCl}_6^{2-}$ , while absorption maxima of 345 and 385 microns are possibly related to the effect of the glacial solvent on the electronic states of selenium(IV) and not to any chloride complex of selenium(IV).  
Orig. art. has: 2 figures and 1 formula. [JPRS: 40,361]

Card 2/2

*Kolesnikova, N.M.*

Category : USSR/Solid State Physics - Mechanical properties of crystals and poly-crystalline compounds E-9

Abs Jour : Ref Zhur - Fizika, No 1, 1957 No 1370

Author : Arkharov, V.I., Ivanovskaya, S.I., Kolesnikova, N.M., Fofanova, T.A.  
Inst : Inst. of Metal Physics, Ural Branch, Acad. Sci. USSR; Ural Polytechn. Inst., USSR

Title : On the Mechanism of the Influence of Phosphorus and Molybdenum Admixtures on the Temper Brittleness of Steel

Orig Pub : Fiz. metallov i metallovedeniye, 1956, 2, No 1, 57-65

Abstract : Specimens of chrome-nickel structural steel with normal and increased content of P (within its solubility limits) were heat treated to produce a viscous or a brittle state. The fracture surfaces were chemically analyzed using the Tananayev chipless method. It was established that the content of P is substantially higher in the surface layer of brittle (inter-crystallitic) fracture than in that obtained in impact fracture (the latter has in the surface layer a content of P that is equal to the average value obtained by usual chemical analysis for the alloy as a whole). Analogous results were obtained with steels of the same composition, but with Mo added;

Card : 1/2

Category : USSR/Solid State Physics - Mechanical properties of crystals and poly- E-9

~~APPROVED FOR RELEASE~~ 09/17/2001

CIA-RDP86-00513R000723820005-4"

Abs Jour : Ref Zhur - Fizika, No 1, 1957 No 1370

In these cases the enrichment of P in the surfaces of the brittle fracture is less than in steels without molybdenum. It is also established that the diffusion of phosphorus in steel is predominantly along the grain boundaries. The results are explained from the point of view of the theory of the internal inter-crystallitic adsorption of P (Arkharov, V.I., Dokl. AN SSSR, 1945, 50, 293).

Card : 2/2

NOVIKOV, A.S.; TOLSTUKHINA, F.S.; KOLESNIKOVA, N.N.

Creep of the SKF-26 vulcanizates. Kauch. i rez. 23 no.5:8-14 My '64.  
(MIRA 17:9)

1. Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti.

DAVYDOV, V.N., inzh.; KOLESNIKOVA, N.N., inzh.

Improving the electric power supply systems of d.c. electric railroads.  
Zhel.dor.transp. 42 no.11:18-22 N '60. (MIRA 13:11)

1. Glavnyy spetsialist Transselektroproyekta (for Davydov). 2. Rudko-  
voditel' brigady Transselektroproyekta (for Kolesnikova).  
(Electric railroads--Substations)

NOVIKOV, A.S.; TOLSTUKHINA, F.S.; KOLESNIKOVA, N.N.

Creep of vulcanizates based on the viton A type polymer.

Kauch.i rez. 21 no.5:9-14 My '62.

(MIRA 15:5)

1. Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti.  
(Rubber, Synthetic--Testing)

ACCESSION NR: AP4038907

S/0138/64/000/005/0008/0014

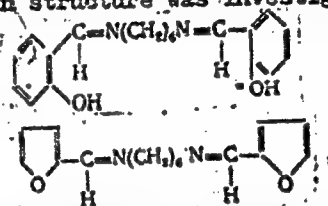
AUTHORS: Novikov, A. S.; Tolstukhina, F. S.; Kolesnikova, N. N.

TITLE: Creep in vulcanized rubber SKF-26

SOURCE: Kauchuk i rezina, no. 5, 1964, 8-14

TOPIC TAGS: vulcanized rubber, relative deformation, argon, creep process, oxygen concentration, rubber SKF 26

ABSTRACT: The effect of air and argon on SKF-26 vulcanized rubber creep with various vulcanization bonds and identical molecular chain structure was investigated. The types of vulcanized rubbers tested were: types GMDA



tin diethyldithiocarbamate, and benzoyl peroxide. Relative deformation versus time curves were obtained for all rubber specimens at various temperatures (180-260°C) both in air and in argon. The results show a significant decrease in the actual  
Card 1/2

MAGAL'NIK, Ye.V., kand.med.nauk; KOLESNIKOVA, N.S. , vrach

Condition of the pupils in hemicrania. Vop.neirooft. 7:173-  
179 '61. (MIRA 14:9)

(MIGRAINE)

(PUPIL (EYE))

BDS

REF NR: AP3003679

8/0186/83/003/005/0264/0290

Klokman, V. R.; Kolesnikova, N. S.

Study of the behavior of Sr sup 90 in melts in the systems PbCl<sub>2</sub>sub2-SrCl<sub>2</sub> and PbCl<sub>2</sub>sub2-SrCl<sub>2</sub>sub2-NaCl by isomorphic co-crystallization

Radiokhimiya, v. 5, no. 3, 1963, 284-290

Sr sup 90, Pb sub 2, SrCl Sub 2, LiCl, NaCl, co-crystallization

This study presents the experimental results obtained from the study of SrCl<sub>2</sub> in the crystalline melt of PbCl<sub>2</sub> in simple eutectic PbCl<sub>2</sub>-LiCl and PbCl<sub>2</sub>-NaCl. The study showed that the coefficient of crystallization of SrCl<sub>2</sub> remains constant not only at the time of change in the solid phase, but also during the change of the composition of the melt and change of temperature in the PbCl<sub>2</sub>-LiCl system. The coefficient of crystallization of SrCl<sub>2</sub> in this system is 2.3. In the system PbCl<sub>2</sub>-NaCl, the coefficient of crystallization of SrCl<sub>2</sub> remains practically constant during the change of temperature and composition of the melt. However, it differs from the SrCl<sub>2</sub> obtained in the PbCl<sub>2</sub>-LiCl system. The coefficient of crystallization



100-003  
 REFERENCE NR: AP3003679

Letter is 8.9. It was shown that by isomorphous co-crystallization in  
 simple eutectic systems  $PbCl_2$ -LiCl and  $PbCl_2$ -NaCl, the composition of  $SrCl_2$   
 in a microquantity does not depend on the nature of the solvent, however,  
 activity of the lead ions in the NaCl fusion decreases on account of the  
 formation of complex lead ions. Orig. art. has: 7 tables.

ABSTRACT: None

22Sep62

DATE ACQ: 07Aug63

ENCL: 00

CH, ML

NO REF SOV: 015

OTHER: 004

ACCESSION NR: AF4020054

8/0186/64/006/001/0011/0018

AUTHOR: Klokman, V. R.; Kolesnikova, N. S.

TITLE: A study of complexing in fusions by the isomorphic crystallization method in the systems  $\text{PbCl}_2$  sub 2-Sr sup \* Cl sub 2-RbCl and  $\text{PbCl}_2$  sub 2-Sr sup \* Cl sub 2-CsCl

SOURCE: Radiokhimiya, v. 6, no. 1, 1964, 11-18

TOPIC TAGS: complexing, fusion, isomorphic crystallization method,  $\text{PbCl}_2$  sub 2-Sr sup \* Cl sub 2-RbCl,  $\text{PbCl}_2$  sub 2-Sr sup \* Cl sub 2-CsCl, SrCl sub 2, LiCl, NaCl, KCl

ABSTRACT: Study of the coprecipitation of  $\text{Sr}^{90}$  with crystals of lead chloride, precipitated from fusions of lithium and sodium chloride, which, with  $\text{PbCl}_2$  and  $\text{SrCl}_2$ , provide systems with a simple eutectic, led to an interest in comparing results obtained on the behavior of  $\text{Sr}^{90}$  in more complex systems in which there is a formation of complex compounds. From the fusibility curve for the binary system  $\text{PbCl}_2$ -MeCl, and  $\text{SrCl}_2$ -MeCl, where Me is an alkali metal, complex compounds of lead and strontium precipitating in a separate solid phase begin to develop in systems with potassium chloride. The number of compounds and their stability are

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ACCESSION NR: AP4020054.

different during conversion from one alkali chloride to another, both for the system with  $PbCl_2$  and the system with  $SrCl_2$ . Coefficients of crystallization of  $SrCl_2$  in systems  $PbCl_2$ - $RbCl$  and  $PbCl_2$ - $CaCl_2$  are determined. Higher values are obtained in systems  $PbCl_2$ - $RbCl$  and  $PbCl_2$ - $CaCl_2$  as compared with the systems formed by lead chloride with  $LiCl$ ,  $NaCl$  and  $KCl$ . This is explained by the increased stability of complex compounds of the macrocomponent with an increase of ionic radii of alkali metals. It was established that the stability of complex compounds of  $PbCl_2$  with chlorides of alkali metals, under the conditions in question, is greater than the stability of the corresponding complex compounds of strontium. Using an isomorphic method of cocrystallization, it is possible to establish the presence of complex compounds in the fusion, not only in the area of crystallization of complex compounds but also in the area of precipitation in the solid phase of the pure component. Orig. art. has: 9 tables, 4 figures.

Card 2/3 2

WRITE BELOW THE LINE

Country : USSR

M

Category: Cultivated Plants. Commercial. Oil-Bearing.  
Sugar-Bearing.

Abstr Jour: RZhBiol., No 11, 1958, No 49031

Author : Kolesnikova, N.T.

Inst : State Commission on Variety Testing Agric. Crops.

Title : The Method of Dense Sowing of Gambo Hemp.

Orig Pub: Inform. byul. Gos. komis. po sortoispyt. s.-kh.  
kul'tur pri M-ve s.kh. SSSR, 1956, No 11, 15-17

Abstract: An experiment is generalized, carried out at the Nizhne-Chuyskiy Fiber Crop Sovkhoz in the Kirgiz SSR. In this experiment, gambo hemp was sown in narrow, double rows with a distance of 34 cm between the rows and 11 cm between the strips. By this new

Card : 1/2

M-110

Country : USSR

Category: Cultivated Plants. Commercial. Oil-Bearing.  
Sugar-Bearing.

Abstr Jour: RZhBiol., No 11, 1958, No 49031

sowing method, the richness of the plant stands has been increased by 40% compared with the method of wide and single rows. As a result, a better utilization of the area, more even stems and an earlier closure of the openings between the rows is reported, increasing the harvest of gambo hemp stalks by 13-27%. -- D.D. Vakhmistrov

Card : 2/2

KOLESNIKOVA, N. V. , BALACHOVSKIY, S. D., and TROITSKAJA, N. A

6509

KOLESNIKOVA, N. V., BALACHOVSKIY, S. D., and TROITSKAJA, N. A.  
Physiological action and changes in the composition of substances  
related to vitamin A Biochim., Mosk. 1950, 15/3(267-271) Tables I

Antihistamine action of derivatives of citral was investigated on the  
guinea-pig intestine. Citronellal, 6-7- dibromocitral and geraniol  
act similarly to citral. Weaker action was noted with mesityl oxide.  
It is concluded that the whole molecule and not a particular part of  
citral is the carrier of the specific antihistamine activity. The  
term "true analgetic" is proposed for substances producing depression  
of pain without changes of excitability of other senses.  
Szabuniewicz -Cracow

SO: Excerpta Medica, Section II Vol. 4, No. 12

*Inat. Biochem. in A.N. Bakh, Acad. Medical Sci USSR*

TROITSKIY, S.A.; KOLESNIKOVA, N.V.; KOZHEVNIKOVA, Z.I. (Gor'kiy)

Significance of antileukocytic autoantibodies in the pathogenesis  
of benzene leukopenia. Gig.truda i prof.zab. 3 no.4:50-51  
Jl-Ag '59. (MIRA 12:11)

1. Institut gigiyeny truda i profzabolevaniy.  
(ANTIGENS AND ANTIBODIES)  
(BENZENE--TOXICOLOGY)

S/169/62/000/001/045/083  
D228/D302

AUTHORS: Kazanskiy, A. B. and Kolesnikova, N. V.  
TITLE: Heat balance of the valley surface of the R. Sel'dara  
near the tongue of the Fedchenko Glacier  
PERIODICAL: Referativnyy zhurnal, Geofizika, no. 1, 1962, 21, ab-  
stract 1B153 (V sb. Glyatsol. issledovaniya, no. 6,  
M., AN SSSR, 1961, 104-110)

TEXT: The authors present the results of observations, obtained by the glaciologic expedition of the Akademiya nauk Uzbekskoy SSR (Academy of Sciences, Uzbek SSR), for the heat balance of the ground surface and for wind, temperature, and humidity conditions. It is noted that a mountain valley circulation is observed in the summer months near the tongue of the Fedchenko Glacier. The amplitude of the mean-daily variation of the heat flow in the vicinity of the tongue of the Fedchenko Glacier has a considerable magnitude. Convection is observed in the morning and afternoon hours above the valley surface of the R. Sel'dara. At night the valley

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1 02748-66 EWT(m)/EWP(1)/EWP(1) LJP(1) JD  
AP6010112 (A) SOURCE CODE: UR/0190/66/008/003/0481/0485

AUTHORS: Tukel'son, I. I.; Garmonov, V. I.; Nazarova, A.B.;  
Kolesnikova, O. G.

ORG: Voronezh Institute of Technology (Voronezhskiy tekhnologicheskii  
institut)

TITLE: Investigation of the polycondensation of diphenyl with di-  
chloroethane in the presence of aluminum trichloride and the structure  
of the products obtained

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 8, no. 3, 1966, 481-485

TOPIC TAGS: diphenylamine, aluminum chloride, polycondensation,  
polymer, molecular weight, catalyst, chemical reaction kinetics

ABSTRACT: The reaction of diphenyl with dichloroethane in the presence  
of the  $AlCl_3$  results in the formation of polydiphenylenethyl. It was  
found that the molecular weight of polydiphenylenethyl increases with  
the decrease of the diphenyl-to-dichloroethane ratio, with the excess  
of the former resulting in the formation of a foam-like crosslinked  
polymer. With the catalyst amount is increased, the molecular weight  
first rises and then drops so that there is an optimum catalyst con-  
centration for every diphenyl-to-dichloroethane ratio. For the ratio

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UDC: 541.64+678.01:53+678.71



L 2274-66

ACC NR: AP6010112

of 1.5:1.0, the molecular weight of 4000 is reached at 23% of catalyst concentration. The kinetics of the reaction are satisfactorily described by the equation 
$$P = \frac{t}{19+1,665 t}$$
, where  $P$  is the conversion,

and  $t$  is the time from the beginning of the reaction in minutes. It follows from the IR spectrum that the polydiphenylenethyl molecules possess a linear structure with ortho-positions of substituents. Orig. art. has: 3 figures, 1 formula, and 1 table. [Based on author's abstract]

[NT]

SUB CODE: 07/

SUBM DATE: 02Apr65/

ORIG REF: 007/

OTH REF: 004/

Card 2/2

KOLESHNIKOVA, P. D.

KOLESHNIKOVA, P. D. - "Physiological Evaluation of the Water Regime of Alfalfa in Pure and Mixed Sowings." Min of Higher Education USSR, middle Asia State U imeni V. I. Lenin, Tashkent, 1955 (Dissertations For the Degree of Candidate of Biological Sciences)

SO: Knizhnaya Letopis' No, 26, June 1955, Moscow

*KOLESNIKOVA, P.D.*

USSR/Physiology of Plants - Water Regime.

I.

Abs Jour : Ref Zhur - Biol., No 15, 1958, 67834

Author : Kolesnikova, P.D.

Inst : Academy of Sciences UzSSR

Title : The Influence of Aquous and Nutritive Regimes on the Growth and Development of Lucerne and Grasses.

Orig Pub : Sb.: Vopr. fiziol. khlopchatnika i trav. No 1, Tashkent, AN UzSSR, 1957, 107-131.

Abstract : In the Agricultural Institute of the Academy Sci UzSSR, field and vegetation experiments were conducted for two years on plots of lucerne, both pure and mixed with an orchard grass combination and with multi-yield ray grass. In the third leaf layer from the top the magnitude of the suctorial force (determined by V.S. Shardaakova's gradient tube method) and, to a lesser extent, of the osmotic

Card 1/2

- 17 -

KOLESNIKOVA, P.D.

Rates of suction increase in the leaves of lucerne and cereal  
grasses in the periods between watering. Dokl. AN Tadzh. SSR  
3 no.3:43-47 '60. (MIRA 16:2)

1. Stalinabadskiy institut im. T.G. Shevchenko. Predstavleno aka-  
demikom AN Tadzhikskoy SSR N.N. Ovechinnikovym.  
(Forage plants—Water requirements)

1ST 2ND 3RD 4TH 5TH 6TH 7TH 8TH 9TH 10TH 11TH 12TH 13TH 14TH 15TH 16TH 17TH 18TH 19TH 20TH 21TH 22TH 23TH 24TH 25TH 26TH 27TH 28TH 29TH 30TH 31ST 32ND 33RD 34TH 35TH 36TH 37TH 38TH 39TH 40TH 41ST 42ND 43RD 44TH 45TH 46TH 47TH 48TH 49TH 50TH 51ST 52ND 53RD 54TH 55TH 56TH 57TH 58TH 59TH 60TH 61ST 62ND 63RD 64TH 65TH 66TH 67TH 68TH 69TH 70TH 71ST 72ND 73RD 74TH 75TH 76TH 77TH 78TH 79TH 80TH 81ST 82ND 83RD 84TH 85TH 86TH 87TH 88TH 89TH 90TH 91ST 92ND 93RD 94TH 95TH 96TH 97TH 98TH 99TH 100TH																			
KOLESNIKOVA, P. Yu.										26									
CA																			
<p>Chlororubber varnishes from domestic raw materials.  P. Yu. Kolesnikova. <i>Izv. Akad. Nauk SSSR, Ser. Khim. Nauk</i>, 1940, No. 7, 97. — Expts. were carried out for the production of varnishes on chlororubber base prepd. from the Soviet synthetic rubber (Sovprene) and plant rubber (from kok-saghyz and guayule). The contents of Cl in the chlororubbers varied from 40 to 60%. The colorless varnishes, pigmented enamels and bitumen chlororubber varnishes prepd. on the basis of the chlororubbers formed hard, glossy, chemically stable films.</p>										W. R. Hunt									
ASB-51A METALLURGICAL LITERATURE CLASSIFICATION										RECORDS									
SUBJECT										CLASSIFICATION									
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100										1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100									

Kolesnikov, P.Yu.

USSR/Chemistry - Protective coatings

FD-3005

Card 1/1      Pub. 50 - 6/17

Authors : Kolesnikova, P. Yu., Korzin, N. V.

Title : ~~Experience in the application of anti-corrosion lacquer, varnish, and paint materials at chemical plants~~  
Experience in the application of anti-corrosion lacquer, varnish, and paint materials at chemical plants

Periodical : Khim. prom. No 6, 345-350, Sep 1955

Abstract : The results of testing various anti-corrosion coatings at plants producing chlorine, nitrogen fertilizers, and superphosphate are reported. Five figures.

Institution : All-Union Office "Lakokraskopokrytiye" [Lacquer, Varnish, and Paint Coatings]

KOLESNIKOVA, R. S.

KOLESNIKOVA, R. S.: "Indications for operations on the lungs in nonspecific suppurative processes". Moscow, 1955. Second Moscow State Medical Institute I. V. Stalin. (Dissertations for the degree of Candidate of Medical Science.)

SO: Knizhnaya Letopis' No. 50 10 December 1955. Moscow.

BAKULEV, A.N.; KOLESNIKOVA, R.S.

Therapeutic fasting in chronic coronary insufficiency and in  
a number of other diseases. Trudy Inst. klin. i eksper. kard.  
AN Gruz. SSR 8:437-439 '63. (MIRA 17:7)

1. Kafedra gospiial'noy khirurgii i Meditsinskogo instituta,  
Moskva.



KOLESNIKOVA, R.S.; RODYGINA, G.V.; EDEL'SHTEYN, S.I.

Use of penicillin aerosols in chronic suppurative processes of the lung. Khirurgiya 32 no.8:39-41 Ag '56. (MIRA 9:12)

Is fakul'tetskoy khirurgicheskoy kliniki imeni S.I.Spasokukotskogo (zav. - prof. A.N.Bakula) II Moskovskogo meditsinskogo instituta imeni I.V.Stalina i otdela eksperimental'noi terapii (zav. - prof. Z.V.Yermol'yeva) Vsesoyuznogo nauchno-issledovatel'skogo instituta antibiotikov.

(LUNG DISEASES, ther.

penicillin aerosols in chronic suppuration)

(PENICILLIN, ther. use

chronic suppuration of lungs, admin. in aerosol form)

(AEROSOLS, ther. use

penicillin in chronic suppuration of lungs)

KOLESNIKOVA, R.S., kand.med.nauk; MEYTINA, R.A., kand.biol.nauk

Studies of external respiration and of blood gases in patients with chronic pulmonary suppuration. Nov.khir.arkh. no.1:66-73 Ja-F '59. (MIRA 12:6)

1. Kafedra fakul'tetskoy khirurgii II (zav. - prof.A.N.Bakulev)
- 2-go Moskovskogo meditsinskogo instituta i Instituta grudnoy khirurgii AMN SSSR.  
(BLOOD, GASES IN) (RESPIRATION) (LUNGS--ABSCESS)

GERESIMOVA, A.V. (Moskva, ulitsa Kirova, dom 13, kv. 26); KOLESNIKOVA, R.S.

Treatment of tumors of the mediastinum. Grud. khir. 2 no.6:99-103  
N-D '60. (MIRA 14:1)

1. Iz fakul'tetskoy khirurgicheskoy kliniki imeni S.I.Spasokukot-  
skogo (dir. - akad. A.N.Bakulev) i khirurgicheskogo otdeleniya  
pervoy gorodskoy klinicheskoy bol'nitsy imeni N.I.Pirogova (glavnyy  
vrach zasluzhennyy vrach RSFSR L.D.Chernyshov).  
(MEDIASTINUM--TUMORS)

BAKULEV, Aleksandr Nikolayevich; KOLESNIKOVA, Roza Samoylovna;  
ROVNOV, S.A., red.; ROMANOVA, Z.A., tekhn.red.

[Surgical treatment of suppurative pulmonary diseases]  
Khirurgicheskoe lechenie gnoinykh zabolevani legkikh.  
Moskva, Medgiz, 1961. 206 p. (MIRA 15:2)  
(LUNGS--SURGERY)

KOLESNIKOVA, R.S.

Studying the antigenic properties of the causative agent of "madden-  
ing" and investigating a serological method for its detection. Nauch.  
soob. IAFAN SSSR no.5:109-111 '61. (MIRA 14:12)

(Yakutia--Foxes--Diseases and pests)

(Yakutia--Bugs--Diseases and pests)

(Serum diagnosis)

KOLESNIKOVA, R.S.

New medium for isolating and preserving Brucella strains from cattle  
in Yakutia. Nauch. soob. IAFAN SSSR no.5:113-116 '61.

(MIRA 14:12)

(YAKUTIA--BRUCELLOSIS IN CATTLE)  
(BACTERIOLOGY--CULTURES AND CULTURE MEDIA)

KOLESNIKOVA, R.S. (Moskva, Prosp. Mira, d.103,kv.155)

Study of protein fractions in chronic suppurations of the  
lungs. Grud. khir. 2 no.1:82-85 Ja-F '60. (MIRA 15:3)

1. Iz Instituta grudnoy khirurgii AMN SSSR (dir. - prof.  
A.A. Busalov) i khirurgicheskogo otdeleniya I Gorodskoy  
klinicheskoy bol'nitsy imeni N.I. Pirogova (glavnyy vrach -  
zasluzhennyy vrach RSFSR L.D. Chernyshov).

(LUNGS---DISEASES)

(BLOOD PROTEINS)

KOLESNIKOVA, R.S., kand.med.nauk; BUKHARIN, V.A.

Pseudomyxomatosis of the abdominal cavity. Vest.khir. no.7:79-  
88 '61. (MIRA 15:1)

1. Iz fakul'tetskoy khirurgicheskoy kliniki (dir. - prof. A.N. Bakulev) 2-go Moskovskogo meditsinskogo instituta i khirurgicheskogo otdeleniya 1-y gorodskoy klinicheskoy bol'nitsy imeni N.I. Pirogova (gl. vrach - L.D. Chernyshev).  
(ABDOMEN—TUMORS)



BAKULEV, A. N., akad.; KOLESNIKOVA, R. S., kand. med. nauk (Moskva)

Fasting therapy (preliminary report). Klin. med. no.2:14-21 '62.  
(MIRA 15:4)

1. Iz fakul'tetskoy khirurgicheskoy kliniki imeni S. I. Spasokukotskogo (zav. - akad. A. N. Bakulev) i Instituta grudnoy khirurgii (dir. - prof. S. A. Kolesnikov) AMN SSSR.

(FASTING) \*

BAKULEV, A.N., akademik; SAVEL'YEV, V.S., doktor med. nauk; KOLESHNIKOVA, R.S.,  
kand. med. nauk (Moskva, prosp. Mira, d. 103, kv. 155); IGNATENKO, S.I.

Method of artificial blood circulation without using heparinized  
donor blood. Vestn. khir. Grekov. 90 no.4:3-8 Ap'63 (MIRA 17:2)

1. Iz fakul'tetskoy khirurgicheskoy kliniki (direktor - akademik  
A.N. Bakulev) 2-go Moskovskogo meditsinskogo instituta imeni N.I.  
Pirogova.



USSR/Chemistry - Reaction Kinetics

11 Aug 53

"Elemental Reactions of Atomic Oxygen with Methane," L. I. Avramenko and R. V. Kolesnikova

DAN SSSR, Vol 91, No 1, pp 107-109

Studied the reaction between O and CH<sub>4</sub> using a method previously employed in other work. Results indicate that the degree of conversion achieved did not exceed that indicated by other workers [western], although data pertaining to flameless combustion were included. MeOH was found in the reaction products indicating that it forms as a

266T4

result of the interaction of O and CH<sub>4</sub> and is converted to CH<sub>2</sub>O. On the basis of this data, it was difficult to ascertain which of two possible reactions (primary or secondary) forming CH<sub>2</sub>O takes place. Presented by Acad N. N. Semenov 4 May 53.

K - ... V

USSR

The experimental determination of the sequence of elementary reactions of atoms and molecules

1. The first step in the process is to identify the problem. This involves gathering information about the situation and the people involved. It is important to understand the context and the impact of the problem.

KOLESNIKOVA, R. V.

Dissertation: "A Study of Elemental Reactions of Oxygens Atoms with Unsaturated Hydrocarbons." Cand Chem Sci, Inst of Chemical Physics, Acad Sci USSR, 25 Jun 54.

APPROVED FOR RELEASE 09-30-2001

CIA-RDP86-00513R000723820005-4

SO: SUM 318, 23 Dec 1954

development of organic synthesis based on the oxidation of hydrocarbons from petroleum. S. R. Sergeenko. *Problems of Organic Synthesis*. Moscow, 1964. 108 p. 1954 4 10. In the introductory remarks made at the All-Union meeting on 14-18 May 1961, on the use of petroleum in chemical industry was given a brief summary was given of the achievements in U.S.S.R. during the last 10 years.

2. Oxidation in the theory of chain oxidation of hydrocarbons. Sergeenko. Ibid. 13-39. — A comprehensive survey of the following topics was given: direct reactions of saturated hydrocarbons; chain length and free radicals; effect of biradicals on the chain reaction; interaction between the chain reaction and termination among the molecules; branching of chains and burning phenomena; decay of chain reactions; effects of inhibitors; wall effects in chain reactions.

3. Mechanism of negative catalysis in oxidation of hydrocarbons. M. N. Nikanov. Ibid. 40-50. — A review of the types of elementary reactions of simple hydrocarbons with atomic oxygen.

4. Elementary reactions of simple hydrocarbons with atomic oxygen. I. I. Avramenko and R. V. Kuznetsov. Ibid. 51-71. — Oxidation of methane, ethane, propane and isobutane is reviewed. 17 references. Oxidation of hydrocarbons in the presence of hydrogen bromide. G. L. Zaitsev and V. M. Emanuel. Ibid. 80-77. — A re-

[illegible]

...and reviewed 17 references. Oxidation of hydrocarbons in the presence of hydrogen bromide. V. M. Matus and N. M. Emanuel. *Ibid.* 60-77. — A review of references. Investigation of oxidation of propylene. A. F. Lukovnikov. *Ibid.* 74-88. — A review of references. Chromatographic study of the activity of the reaction products of the oxidation. Mechanism of oxidation of ... *Ibid.* 80-103. — A review with

...references. Oxidation of ... *Ibid.* 140-141. — The mechanism of the formation was studied by analyzing the autoxidation products of ... The reaction catd. with 5% aq. NaOH, and an ... of 1,4-dihydro-1,2,3,4-tetrahydronaphthalene. Among the oxidation products were ... naphthyl hydroperoxide, ... naphthalenone, 3,4-dihydro-2,3-dihydroquinone, 6-HO<sub>2</sub>CC<sub>10</sub>H<sub>7</sub>, ... products. Synthesis of ... hydroperoxide and thermal decomposition of ... hydroperoxides. L. I. Yurzhenko, D. ... *Ibid.* 145-151, 21. C.A.

# СРЕСІЕННО

Oxidation of petroleum feed and aerosol with  
nitric acid. P. J. Perry and R. L. Smith  
Oxidation of high molecular  
hydrocarbons and petroleum oils in liquid phase  
Industrial methods of oxidation of petroleum  
hydrocarbons in liquid phase  
A review of the literature on the oxidation of  
petroleum hydrocarbons in liquid phase  
Use of hydroxy acids from oxidation of petroleum  
hydrocarbons as non-forming materials  
The use of hydroxy acids from oxidation of petroleum  
hydrocarbons as non-forming materials  
The use of hydroxy acids from oxidation of petroleum  
hydrocarbons as non-forming materials  
The use of hydroxy acids from oxidation of petroleum  
hydrocarbons as non-forming materials



Kolesnikova, R.V.

USSR/Kinetics - Combustion. Explosions. Topochemistry. Catalysis. B-9

Abs Jour : Referat Zhur - Khimiya, No 6, 1957, 18553

Author : L.I. Avramenko, R.V. Kolesnikova.

Inst : Academy of Sciences of USSR.

Title : Experimental Determination of Succession of Elementary Reactions of Atoms and Radicals.

Orig Pub : in symposium: Tsepnyye reaktsii okisleniya uglevodorodov v gazovoy faze. M., AN SSSR, 1955, 187-209

Abstract : A more detailed report on work published earlier (RZhKhim, 1956, 61054).

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000723820005-4

KOLESNIKOVA, R.V.

USSR/Physical Chemistry - Kinetics. Combustion. Explosives. Topochemistry. Catalysis, B-9

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61054

Author: Avramenko, L. I., Kolesnikova, R. V.

Institution: None *Instit. Chemical Physics, Acad. Sci USSR*

Title: Experimental Determination of the Sequence of Elementary Reactions of Atoms and Radicals

Original

Periodical: Izv. AN SSSR, Otd. khim. n., 1955, No 3, 386-394

Abstract: A description of the method of experimental determination of the sequence of elemental reactions of atoms and radicals. By means of this method it is possible to determine from the final reaction products the primary interaction of atoms or radicals (artificially generated) with the studied molecule under jet conditions. There is presented a theoretical substantiation of the method and experimental data are given relating to reactions of O-atoms with  $C_2H_6$  and HCHO.

KOLESNIKOVA, R.V.

AVRAMENKO, L.I.; KOLESNIKOVA, R.V.

Chemical determination of the initial concentration of oxygen  
atoms in a stream. Zhur.fiz.khim. 29 no.3:539-541 Mr '55.  
(MIRA 8:7)

1. Akademiya nauk SSSR, Institut khimicheskoy fiziki, Moscow.  
(Oxygen)

Kolesnikova R.V.

USSR/Kinetics - Combustion. Explosions. Topochemistry. Catalysis. B-9

Abs Jour : Referat Zhur - Khimiya, No 6, 1957, 18555

Author : L.I. Avramenko, R.V. Kolesnikova.

Title : Reactions of Oxygen Atoms with Ethylene.

Orig Pub : Zh. fiz. khimii, 1956, 30, No 3, 581-588

Abstract : The reaction of O atoms with  $C_2H_4$  was studied at  $150^\circ$  and the pressure of 3 mm of mercury column by mixing in a flow. Basing on the analysis of the reaction products, a reaction scheme confirmed experimentally is proposed. The main initial process appears to be the reaction of breaking the double bound in  $C_2H_4$  with the formation of  $CH_2O$  and the radical  $CH_2$ . It is shown also that the most probable reaction of the radical  $CH_2$  with a  $O_2$  molecule at temperatures to  $150^\circ$  is the reaction of formation of  $CH_2O$ .

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Kolesnikova R.V.

USSR/Kinetics - Combustion. Explosions. Topochemistry. Catalysis. B-9

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000723820005-4

Abs Jour : Referat Zhur - Khimiya, No 6, 1957, 18554

Author : L.I. Avramenko, R.V. Kolesnikova.

Title : On the Mechanism of Hydrogen Peroxide Formation from Atoms and Radicals.

Orig Pub : Zh. fiz. khimii, 1956, 30, No 4, 763-768

Abstract : The dependence of the amount of  $H_2O_2$  forming from the discharge products in water vapor on the distance between the discharge and the trap was measured. The total concentration of the radical OH was determined spectroscopically. Comparing the amount of  $H_2O_2$  found experimentally with the amount which could be expected, if it were produced of OH, the authors arrive to the conclusion that OH could not be responsible for the formation of  $H_2O_2$ . The formation of  $H_2O_2$  from O atoms and  $H_2O$  molecules on trap walls cooled with liquid air was observed, and it was shown that  $H_2O_2$  was formed in the same way from gases

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- 227 -

AUTHORS: Avramenko, L. I., Kolesnikova, R. V., 62-58-3-3/30  
Postnikov, L. M.

TITLE: A New Method for the Determination of the Velocity Constants  
of the Elementary Reactions of Atoms and Radicals (Novyy  
metod opredeleniya konstant skorostey elementarnykh reaktsiy  
atomov i radikalov)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Khimicheskikh Nauk,  
1958, Nr 3, pp. 277-284 (USSR)

ABSTRACT: The authors suggested a new method for the determination of  
the above-mentioned velocity constants which was worked out  
by them. This method avoids many a difficulty connected with  
the measurement of the absolute concentration of the atoms.  
The reaction of the oxygen-atom with different molecules  
serves as example. All processes which take place in the ex-  
periment are schematically represented (see scheme pp. 277  
and 278). By means of the suggested method of measurement the  
summary velocity constant (in this case for the oxygen atom)  
can be determined. This also applies to the velocity con-  
stants of individual primary elementary reactions. It is

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A New Method for the Determination of the Velocity Constants of  
the Elementary Reactions of Atoms and Radicals

62-58-3-3/30

pointed out that all conclusions are only valid in the case of sufficiently high  $A_0$ -values (initial concentration of the initial substance) in comparison with  $(O)_0$  (initial concentration of the oxygen atoms). On the basis of the described method (see formulae 1-16) the velocity constants of the elementary reactions of the oxygen atoms with molecules such as CO, CH<sub>4</sub>, CH<sub>3</sub>OH were determined. Moreover the velocity constants of the reactions of the radicals CH<sub>3</sub> and C<sub>2</sub>H<sub>5</sub> with the oxygen molecule were obtained. There are 13 references, 4 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR  
(Institute for Chemical Physics, AS USSR)

SUBMITTED: January 21, 1957

Card 2/2

AUTHORS: Avramenko, L. I., Kolesnikova, R. V. SOV/62-58-10-5/25

TITLE: Reactions of Free Ethyl Radicals With Molecular Oxygen  
(Reaktsii svobodnykh etil'nykh radikalov s molekulyarnym kislородom)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1958, Nr 10, pp 1192-1198 (USSR)

ABSTRACT: The deficiency in most of the papers previously published concerning reactions of aliphatic radicals with oxygen is that the problem of the subsequent order of the formation of reaction products is not explained. The authors of the present paper chose another way to explain the problem concerning the reactions of the ethyl radicals with molecular oxygen. They attempted to determine the primary products of the interaction of the ethyl radical with the oxygen molecule. In the experiments carried out the authors succeeded in producing ethyl radicals by the action of hydrogen atoms on ethylene. The products of this reaction of the ethyl radical with molecular oxygen (at temperatures of 100-300° C) are either ethylene monoxide or acetaldehyde and hydrogen peroxide.

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Reactions of Free Ethyl Radicals With Molecular  
Oxygen

SOV/62-58-10-5/25

The course of the reaction ( $C_2H_5+O_2$ ) is to a high degree influenced by the surface state of the reaction vessel. The formation of ethylene oxide in the interaction of the ethyl radical and the oxygen molecule takes place at the walls of the reaction vessel, prepared in a corresponding way. The interaction of the ethyl radical with the oxygen molecule neither directly nor by way of the intermediate reactions leads to the formation of the formaldehyde (at temperatures of up to  $300^{\circ}C$ ). There are 5 figures, 1 table, and 8 references, 3 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR  
(Institute of Chemical Physics of the Academy of Sciences USSR).

SUBMITTED: April 18, 1957

Card 2/2

5(4)

AUTHORS: Avramenko, L. I., Kolesnikova, R. V.

SOV/76-32-12-19/32

TITLE: The Mechanism of Formation of  $H_2O$  and  $H_2O_2$  in the Reaction of Hydrogen Atoms With Oxygen Molecules  $O_2$  (O mekhanizme obrazovaniya  $H_2O$  i  $H_2O_2$  pri reaktsii atomov vodoroda s molekuloy kisloroda)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 12, pp 2780 - 2786 (USSR)

ABSTRACT: The results obtained by other authors are given (Refs 1 to 7). They point to the fact that the formation of water takes place in the interior of the reaction vessel, while hydrogen peroxide forms on the refrigerated wall of the receiving vessel. The contradictions to be found in previous papers are probably due to differences in the surface finish of the walls of reaction vessels. To establish this more clearly, hydrogen atoms formed in the high-tension discharge tube were made to react with molecular oxygen at low pressure (6 mm Hg). The receiving vessel was cooled by liquid nitrogen. The wall of the reaction vessel had been pretreated with the reaction products of electric

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*Chem. Phys. Inst Moscow AS USSR*



The Mechanism of Formation of  $H_2O$  and  $H_2O_2$  in the  
Reaction of Hydrogen Atoms With Oxygen<sup>2</sup> Molecules

SOV/76-32-12-19/32

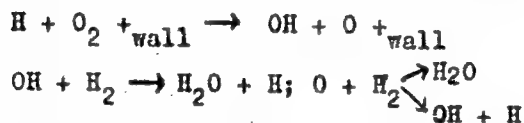
discharge in hydrogen atmosphere. The absolute atom concentration of hydrogen was measured by the heating of a platinum wire or by binding with ethylene. The tests confirmed the assumption that the water is formed in the interior of the reaction vessel, and also that the wall acts as actuator. It follows that the finish of the wall surface also determines the yield. The tests furthermore confirmed the opinion that the hydrogen peroxide is formed on the cooled wall of the receiving vessel. By the addition of ethylene aldehydes are formed. If ethylene is added to the mixture of H and  $O_2$ , aldehydes form generously, while an ethylene-hydrogen mixture to which oxygen is added has a lower aldehyde yield and produces no formaldehyde. If the wall of the reaction vessel is pretreated with the discharge products of the arc in water vapor (and not in hydrogen), much less hydrogen peroxide is produced, and by the addition of ethylene the aldehyde yield is lower and no formaldehyde produced. The investigation proves that a chain reaction with atomic oxygen takes place, for which the lighting in the vessel

Card 2/4

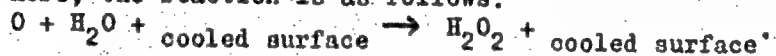
The Mechanism of Formation of  $H_2O$  and  $H_2O_2$  in the  
Reaction of Hydrogen Atoms With Oxygen Molecules

SOV/76-32-12-19/32

(such as it is found in the case of atomic oxygen and hydrocarbons) is yet another proof. The following reaction process has been established:



No molecular oxygen participates in the formation of  $H_2O_2$ . Here, the reaction is as follows:



It was proved also by S. N. Foner and R. L. Hudson (Ref 6) that this is not the case of a binding of two OH-groups. Academician N. N. Semenov was very helpful with his advice. There are 3 tables and 15 references, 5 of which are Soviet.

~~Case 5/4~~

5(4)

## AUTHORS:

Avramenko, L. I., Kolesnikova, R. V.

SOV/62-59-4-33/42

## TITLE:

On the Reaction of Atomic Hydrogen With Ethylene (O reaktsii atomnogo vodoroda s etilenom)

## PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 4, pp 746-748 (USSR)

## ABSTRACT:

This brief communication describes the investigation of the reaction  $H + C_2H_4$ . The investigation was carried out by the discharge tube method on a plant described in reference 15. Two characteristic results which were determined in the analysis of the reaction products in two experimental series with different jet speed are shown in percentages in table 1. Hence it appears that there is always less butane than ethane and propane formation. The ratio ethane-butane increases with a higher jet speed. The measurements of the concentration of hydrogen atoms (without ethylene addition) showed that the initial concentration of H atoms ranks 2 orders higher than the concentration of the ethylene radicals (with ethylene addition). Hence it may be concluded that ethane is formed without the ethyl radicals contained in the volume. Thus

~~Card 1/3~~*Inst. Chem. Phys., AS USSR*

On the Reaction of Atomic Hydrogen With Ethylene

SOV/62-59-4-33/42

only a process is possible which proceeds on the surface of the reaction vessel. In order to check this assumption experiments were carried out in a vessel whose walls had been covered with  $\text{ZnO} \cdot \text{Cr}_2\text{O}_3$ . The results are shown in table 2. Hence it appears that the ratio ethane-butane changed considerably and approached the ratio observed in photochemical tests. It was found that under the conditions assumed (low pressure, fast jet and clean vessel walls) the reaction of the hydrogen atoms with ethylene does not take place in the volume but on the surface. In photochemical tests ethane is mainly formed during the disproportionation of the ethyl radicals at a rate pertaining to the volume process. In the discharge tube ethane is mainly formed on the vessel walls with its characteristic rate. For this reason the different results obtained in photochemical tests and in investigations in the discharge tube might go back to the different mechanisms and rates of ethane formation. The authors thank V. L. Tal'roze and his co-workers for the mass-spectrometrical analysis. There are 2 tables and 16 references, 1 of which is Soviet.

Card 2/3

5(4)

AUTHORS: Avramenko, L. I., Kolesnikova, R. V.

SOV/62-59-9-8/40

TITLE: The Reaction Kinetics and Mechanism of Oxygen Atoms With Carbon Monoxide

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 9, pp 1562-1570 (USSR)

ABSTRACT: This article contains a description of a method of determining the velocity constants for the vanishing of an atom or a radical during a reaction (by entering the bound state) on the formation of carbon dioxide from carbon monoxide and oxygen. On the basis of the consideration of a bimolecular spatial process (collision of two components  $\text{CO} + \text{O} \rightarrow \text{CO}_2$ ) with low activating energy and a small steric factor, and also from the consideration of a trimolecular process ( $\text{CO} + \text{O} + \text{M}$ ), a general equation was obtained for the velocity coefficient. In the statistical consideration of the path of an O-atom in the discharge tube, a function is found which expresses the dependence of the concentration on the traversed path of the atom (7). This function is assumed to be linear (interruption of the ex-

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SOV/62-59-9-8/40

The Reaction Kinetics and Mechanism of Oxygen Atoms With Carbon Monoxide

ponential series after the first term), the concentration is determined at various "x" by experiment and herefrom the velocity constant is calculated. If this function cannot be assumed to be linear, a graphic analysis of the equation is made (Figs 1,2); the represented derivation is generally valid and can be applied to any atoms and radicals desired. The mentioned functions for CO and O are represented on figures 3-5 and the results are discussed. It was possible to draw a conclusion from these on the bimolecular process of the formation of CO<sub>2</sub> from CO and O. There are 5 figures, 1 table and 17 references, 5 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences, USSR)

SUBMITTED: December 11, 1957

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5.2600(A)  
5.3300(A)  
5(4)

66868

AUTHORS: Avramenko, L.I., Kolesnikova, R.V. SOV/76-33-11-30/47

TITLE: Elementary Reaction of the Formation of Oxygen Atoms on the Glass Surface

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 11, pp 2548-2554 (USSR)

ABSTRACT: At the study of the formation mechanism of water and hydrogen peroxide in the reaction of hydrogen atoms with oxygen molecules, oxygen atoms were observed in the reaction zone. Since the experiments were carried out at about 2 torr and up to 250°C, the problem of the formation mechanism remained unsolved. Investigations made by Hudson and Foner (Ref 2) showed that no HO<sub>2</sub> radical is in the reaction space at 1.7 torr, which was also confirmed by Ciguere and Harvey (Ref 3). Several authors (Refs 2,4) explain the formation of water and hydrogen peroxide by the influence of the glass surface of the reaction vessel. To clarify the problem mentioned in the title, experiments were made in two glass units (Fig 1). In one case the surface of the reaction vessel was treated with the reaction products of a hydrogen discharge and subsequently rinsed with phosphoric acid, and in the other case reaction

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Elementary Reaction of the Formation of Oxygen  
Atoms on the Glass Surface

SOV/76-33-11-30/47

products of a water vapor discharge were used. Special experiments were made on the course of a chain reaction at which the concentration of the hydrogen atoms was measured according to two methods. It was established that the water forms due to a chain reaction, which was also confirmed by experiments with ethylene additions. The experiments showed (Table 1) that the wall of the receiver cooled with liquid nitrogen, causes the formation of the hydrogen peroxide, according to the reaction  $O + H_2O + \text{cold surface} \rightarrow H_2O_2 + \text{cold surface}$ . Investigations on the dependence of the accumulation rate of the water and hydrogen peroxide from the rate of addition of the hydrogen showed (Table 2) that the formation of the hydrogen peroxide decreases with a reduction of the transformation percentage of the oxygen. When ethylene was added, i.e. at the reaction  $H + O_2 + C_2H_4$ , the formation of aldehydes was observed in the reaction vessel (and not on the cold surface) (Table 3). The series of experiments in the second reaction unit yielded results differing from those obtained in the above described experiments: considerably

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Elementary Reaction of the Formation of Oxygen  
Atoms on the Glass Surface

66868

SOV/76-33-11-30/47

less hydrogen peroxide was formed, and therefore less water; with addition of ethylene, no formaldehyde was formed and only small quantities of aldehydes formed. Finally it is mentioned that the authors thank N.N. Semenov, Academician, for discussions and advice. There are 1 figure, 3 tables, and 9 references, 5 of which are Soviet.

ASSOCIATION: Akademiya nauk SSSR, Institut fizicheskoy khimii, Moskva  
(Academy of Sciences, USSR, Institute of Physical Chemistry,  
Moscow)

Card 3/3

AVRAMENKO, L.I.; KOLESHNIKOVA, R.V.

Kinetics and mechanism of the reaction between ethyl radicals  
and molecular oxygen. Izv.AN SSSR Otd.khim.nauk no.5:806-811  
Mg '60. (MIRA 13:6)

1. Institut khimicheskoy fiziki Akademii nauk SSSR.  
(Radicals (Chemistry)) (Oxygen)

85602

S/062/60/000/006/015/025/XX  
B020/B060

11.6200

AUTHORS: Avramenko, L. I., Kolesnikova, R. V.

TITLE: Kinetics and Mechanism of Interaction of Ethyl Radicals<sup>1</sup> With  
Molecular Oxygen. Communication 2. Dependence of Reaction  
Kinetics on the Third Particle

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,  
1960, No. 6, pp. 989-995

TEXT: The first part of this article has given a description of method and measurement results of recombination rate constants in the interaction of ethyl radicals with molecular oxygen for a constant concentration of the third particle. The present paper provides the results obtained for different concentrations of the third particle. It follows from the empirically determined dependence of the effective rate constant of the loss of ethyl radicals on pressure (Fig. 1) that the rate constant  $k_0^m$  of the loss is proportional to pressure in the region concerned. Fig. 2 shows different forms of function  $k_0^m = f(M)$  calculated from

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Kinetics and Mechanism of Interaction of  
Ethyl Radicals With Molecular Oxygen.  
Communication 2. Dependence of Reaction  
Kinetics on the Third Particle

S/062/60/000/006/015/025/XX  
B020/B060

equation (4) for different ratios of the constants, where the concentration of the third particle (M) is expressed by pressure  $p$  for  $T = 421^\circ\text{K}$ . It may be stated that the loss of ethyl radical takes place according to a trimolecular scheme with constant  $k_2$ , whose value has been determined at about  $3 \cdot 10^{-28} \text{ cm}^6 \cdot \text{sec}^{-1}$ , and which holds for the case of the third particle being a H molecule. Fig. 3 shows the empirical dependence of the quantity  $1/k_0$  on  $1/p_{\text{H}_2}$  for the recombination of ethyl radicals, while Fig. 4

illustrates the empirical dependence of the effective rate constant of the reaction of the ethyl radical with oxygen atom on pressure. Fig. 5 shows  $1/k$  as a function of  $1/p$  for the reaction of ethyl radicals with molecular oxygen. The absolute value of the rate constant of the bimolecular reaction in the formation of the high-energy  $\text{C}_2\text{H}_5\text{O}_2^*$  radical from  $\text{C}_2\text{H}_5$  and an  $\text{O}_2$  molecule was determined at  $k_1' = 1.1 \cdot 10^{-12} \text{ cm}^3 \cdot \text{sec}^{-1}$ , and the  $k_4'/k_5'$  ratio of the decomposition rate of the radical concerned versus the stabilization rate of the high-energy peroxide radical was determined at  $2 \cdot 10^{-17} \text{ cm}^{-3}$ .

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Kinetics and Mechanism of Interaction of  
Ethyl Radicals With Molecular Oxygen.  
Communication 2. Dependence of Reaction  
Kinetics on the Third Particle

S/062/60/000/006/015/025/XX  
B020/B060

The upper limit of the rate constant  $k_2'$  of the trimolecular reaction was found for the formation of the normal  $\dot{C}_2H_5O_2$  radical from  $C_2H_5 + O_2$  in the case of  $H_2$  being present as third particle:  $k_2' \ll 2.3 \cdot 10^{-30} \text{ cm}^6 \text{ sec}^{-1}$ .

There are 5 figures and 3 references: 1 Soviet, 1 Canadian, and 1 British.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

SUBMITTED: December 15, 1958

Card 3/3

80094

S/020/60/131/06/39/071  
B004/B007

5.3280

AUTHORS: Avramenko, L. I., Kolesnikova, R. V.

TITLE: Reaction of the Isopropyl Radical With the Oxygen Molecule

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 131, No. 6, pp. 1370 - 1372

TEXT: The authors set themselves the task of investigating the reaction mentioned in the title under conditions which excluded every side-reaction of hydrogen used for the preparation of the isopropyl radical with oxygen. This method was already employed in the investigation of the reaction of the ethyl radical with molecular oxygen (Refs 2,3). Molecular hydrogen was decomposed into atoms by electric discharge, and was caused to react with propylene. Through a nozzle the zone of the reaction  $H + C_3H_6 \longrightarrow$  isopropyl was separated from oxidation of the isopropyl radicals carried out at  $150^\circ C$  and 8 torr by means of  $O_2$ . Preliminary experiments had shown that in the oxidation zone (2 cm behind the nozzle) no H-atoms existed. The oxidation products were collected in a vessel cooled with liquid nitrogen, and then analyzed. The peroxide was polarographically analyzed as well as by means of titration of the separated  $I_2$  after the addition of KI. Acetone was

Card 1/2

Reaction of the Isopropyl Radical With the Oxygen  
Molecule

80094

S/020/60/131/06/39/071  
B004/B007

determined by means of the furfural method. Isopropyl alcohol<sup>1</sup> was qualitatively detected by means of m-nitrobenzaldehyde. An analysis for aldehydes was made polarographically. As shown by table 1, peroxide, acetone, and isopropylalcohol were found, whereas analysis for aldehydes was unsuccessful. On the assumption that the reaction temperature for the formation of aldehydes was too low, experiments were undertaken, in which the oxidation zone of 150°C was followed by a second reaction zone of 350°C. As shown by table 2, the peroxide yield decreased, and no more isopropyl alcohol formed, whereas the acetone yield decreased only slightly. Also in this case a formation of aldehydes could not be detected. Herefrom the authors conclude that at 350°C the peroxide radical again decomposes into isopropyl and O<sub>2</sub>. The acetone probably forms on the surface of the reactor vessel, which is covered with KCl. There are 2 tables and 6 references, 4 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of  
Chemical Physics of the Academy of Sciences, USSR)

PRESENTED: October 26, 1959, by V. N. Kondrat'yev, Academician

SUBMITTED: October 20, 1959

Card 2/2

AVRAMENKO, L. I.; KOLESNIKOVA, R. V.

Kinetics and mechanism of the interaction between ethyl radicals and molecular oxygen. Report No.2: Dependence of the reaction kinetics on a third particle. Izv. AN SSSR. Otd. khim. nauk no.6:989-995 J1 '60. (MIRA 13:7)

1. Institut khimicheskoy fiziki Akademii nauk SSSR.  
(Oxygen) (Radicals(Chemistry))



AVRAMENKO, L.I.; KOLESNIKOVA R.V.

Kinetics and mechanism of the reaction of the  $\text{CH}_2\text{OH}$  radical with the  $\text{O}_2$  molecule. Izv.AN SSSR Otd.khim.nauk no.4:591-598 Ap '61.  
(MIRA 14:4)

1. Institut khimicheskoy fiziki AN SSSR.  
(Oxygen) (Radicals (Chemistry))

AVRAMENKO, L.I.; KOLESNIKOVA, R.V.; KUZNETSOVA, N.L.

Rate constant and mechanism of the reaction of oxygen atoms with  
methyl alcohol. Izv.AN SSSR Otd.khim.nauk no.4:599-603 Ap '61.  
(MIRA 14:4)

1. Institut khimicheskoy fiziki AN SSSR.  
(Oxygen) (Methanol)

29121  
S/020/61/140/005/017/022  
B101/B110

11.1510

AUTHORS: Avramenko, L. I., and Kolesnikova, R. V.

TITLE: Determination of  $\text{HO}_2$  radicals by the epr method

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 5, 1961, 1100-1101

TEXT: The authors tried to find a method of determining  $\text{HO}_2$  radicals more simply than by the hitherto used mass spectrometry (Ref. 1, see below). The  $\text{HO}_2$  radical was found to be detectable by electron paramagnetic resonance (epr). The following experiment is described: Hydrogen molecules were reduced to atoms in an ozonizer tube, and sprayed at 90 cm/sec through a nozzle into the reaction vessel into which molecular oxygen was also flowing. Total pressure was 60 mm Hg. The resulting  $\text{HO}_2$  radicals were frozen by liquid nitrogen. The epr spectrum was taken with an  $\text{UXF-2}$  (IKhF-2) radiospectrometer by G. A. Kapralova. Fig. 1 shows the epr spectrum. The distance between points A and B is 23-26 oersteds. The g factor of the  $\text{HO}_2$  radical nearly agrees with the g factor of diphenylpicrylhydrazine. No epr Card 1/b<sub>2</sub>

29121

S/020/61/140/005/017/022  
B101/B110

Determination of  $\text{HO}_2$  radicals.

spectrum was observed when the reaction vessel was heated and then cooled to  $77^\circ\text{K}$ , or when there was no  $\text{O}_2$  present in the experiment. Chemical analysis of the reaction products:  $\text{H}_2\text{O}_2$  was found after opening the reaction vessel in all experiments in which the epr spectrum of the  $\text{HO}_2$  radical was observed. If there was no epr spectrum,  $\text{H}_2\text{O}_2$  was not present either. Apparatus and kinetics of reaction will be published later. There are 1 figure and 2 references: 1 Soviet and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: Ref. 1: S. N. Foner, R. L. Hudson, J. Chem. Phys., 21, 1608 (1953).

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences USSR)

PRESENTED: May 20. 1961 by V. N. Kondrat'yev, Academician

SUBMITTED: May 17. 1961

Card 2/2

29121  
S/020/61/140/005/017/022  
B101/B110

11.1510

AUTHORS: Avramenko, L. I., and Kolesnikova, R. V.

TITLE: Determination of  $\text{HO}_2$  radicals by the epr method

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 5, 1961, 1100-1101

TEXT: The authors tried to find a method of determining  $\text{HO}_2$  radicals more simply than by the hitherto used mass spectrometry (Ref. 1, see below). The  $\text{HO}_2$  radical was found to be detectable by electron paramagnetic resonance (epr). The following experiment is described: Hydrogen molecules were reduced to atoms in an ozonizer tube, and sprayed at 90 cm/sec through a nozzle into the reaction vessel into which molecular oxygen was also flowing. Total pressure was 60 mm Hg. The resulting  $\text{HO}_2$  radicals were frozen by liquid nitrogen. The epr spectrum was taken with an  $\text{UXF-2}$  (IKhF-2) radiospectrometer by G. A. Kapralova. Fig. 1 shows the epr spectrum. The distance between points A and B is 23-26 oersteds. The g factor of the  $\text{HO}_2$  radical nearly agrees with the g factor of diphenylincrylhydrazine. No epr

Card 1/2

AVRAMENKO, L.I.; KOLESNIKOVA, R.V.; SOROKINA, M.F.

Rate constant and the mechanism of reaction between oxygen atoms  
and acetaldehyde. Izv.AN SSSR.Otd.khim,nauk no.6:1005-1010 Je '61.  
(MIRA 14:6)

1. Institut khimicheskoy fiziki AN SSSR.  
(Acetaldehyde) (Oxygen) (Chemical reaction, Rate of)

29518

S/062/61/000/011/005/012

B101/B147

11.1510  
11.1220

AUTHORS:

Avramenko, L. I., and Kolesnikova, R. V.

TITLE:

Determination of the rates of elementary reactions of hydrogen atoms. Communication 1. Constant of the recombination rate  $H + H + H_2 \rightarrow 2H_2$ , and constant of the reaction rate  $H + O_2 + H_2 \rightarrow HO_2 + H_2$

PERIODICAL:

Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 11, 1961, 1971-1976

TEXT: It was the purpose of the present paper to determine exactly the reaction constant in ternary collisions  $H + O_2 + H_2$ . So far, the values determined by other scientists have differed by two orders of magnitude. The method of measuring the constant has already been published by the authors (Ref. 7. Izv. AN SSSR. Otd. khim. n., 1958, 277). The device of Fig. 1 was used for the experiments. Atomic hydrogen was obtained in an ozonizer tube (5) whose voltage was increased by a transformer to 40,000 v. ✓

Card 1/05

29518 S/062/61/000/011/005/012  
B101/B147

Determination of the rates of...

To obtain a great number of H atoms in reaction vessel (7), the wall of nozzle (6) was coated with phosphoric acid. The reaction vessel was 20 mm in diameter and 1.2 m long. Valve (2) was similar to valves of Aqualungs used by divers, and guaranteed a constant pressure of electrolytic  $H_2$  leaving cylinder (1). The apparatus was evacuated by an oil forepump;  $P_H$  of the reaction vessel was 60 mm Hg, and the rate  $w$  of the H stream was 90 m/sec. The experiments were conducted at room temperature. Liquid  $N_2$  was used for cooling receiver (10). Results: (1)  $H_2O_2$  could not be titrimetrically detected in 10 without  $O_2$  additions. (2) With  $O_2$  additions,  $(6-7) \cdot 10^{-6}$  M  $H_2O_2$  was titrimetrically detected in 10. (3) 40 mm behind the nozzle  $H_2O_2$  formation is completed. Greater length of the reaction vessel no longer affects the  $H_2O_2$  yield. (4)  $H_2O_2$  does not form at lower pressures (10 mm). Hence, it is concluded that: (A)  $H_2O_2$  formation is independent of the length of the cold wall and, therefore, takes place in

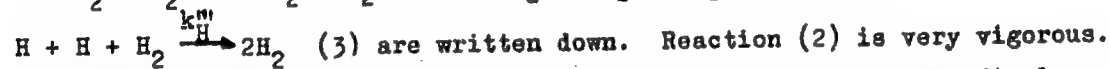
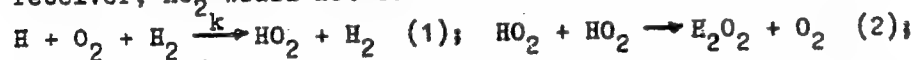
Card 2/0 *B*



29518  
S/C62/61/000/011/005/012  
B101/B147

Determination of the rates of...

the bulk. (B) A third particle takes part in  $H_2O_2$  formation. The reaction, therefore, necessarily follows the equation  $H + O_2 + H_2 \rightarrow HO_2 + H_2$ . In experiments with a cooled receiver placed only 40 mm off the nozzle, the asymmetric epr spectrum of the  $HO_2$  radical could be taken in the frozen condensate. Its g factor hardly differs from that of diphenyl picryl hydrazyl. The total signal width is 23-26 oe. When the condensate is thawed, the signal disappears. With a greater distance between nozzle and receiver,  $HO_2$  would not be detected. The reactions



The method published in Ref. 7 was used for determining k. The final concentration  $[H_2O_2]_f$  is expressed by  $[H_2O_2]_f = [O_2]_0 - [O_2]_f$ , where  $[O_2]_0$

is the initial oxygen concentration. Since  $[H_2O_2]$  and  $[O_2]$  were constant

Card 3/5

29518

S/062/61/000/011/005/012  
B101/B147

Determination of the rates of...

under experimental conditions, the equation

$$[k/(k-k_H^m)]([O_2]_0 - [H_2O_2]_f) + \{[H]_0 - [k/(k-k_H^m)][O_2]_0\}(1 - [H_2O_2]_f/[O_2]_0)^{k_H^m/k} - 0$$

is obtained.  $(1 - [H_2O_2]_f/[O_2]_0)^{k_H^m/k}$  is expanded in a series, the first two members of which are used:  $1/[H_2O_2]_f = 1/[H]_0 + k_H^m/k[O_2]_0$  (9). This linear equation gives:  $k = k_H^m/\tan\alpha$  (10). Hence, the determination of  $k_H^m$  is necessary. It was conducted by a method described by the authors (Izv. AN SSSR, Otd. khim. n. 1959, 1562). The experimental data yielded:  $k_H^m[H]_0 = w \tan\beta/[H_2]$  (13). It was found:  $k_H^m[H]_0 = 9 \cdot 10^{-19} \text{ cm}^3/\text{sec} \cdot \text{molecule}$ . Hence,  $k_H^m = 5.2 \cdot 10^{-32} \text{ cm}^6 \cdot \text{sec}^{-1} \cdot \text{molecules}^{-2}$  is obtained for an initial concentration  $[H]_0 = 1.72 \cdot 10^{13} \text{ molecules/cm}^3$ , which is in good agreement with data obtained by other scientists.  $k = 1.2 \cdot 10^{-33} \text{ cm}^6 \cdot \text{cm}^{-1} \cdot \text{molecules}^{-2}$  is obtained from Eq. (10). This value is in good agreement with that given by A. B. Nalbandyan, V. V. Voyevodskiy (Mekhanizm okisleniya i gorennya Gard 4/0 5

29518  
S/062/61/000/011/005/012  
B101/B147

Determination of the rates of...

vodoroda (Mechanism of hydrogen oxidation and burning), Izd. AN SSSR, 1949). The authors thank G. A. Kapralova for taking the epr spectra. There are 4 figures, 1 table, and 10 references: 4 Soviet and 6 non-Soviet. The two most recent references to English-language publications read as follows: J. Amdur, J. Amer. Chem. Soc., 60, 2347 (1938); S. N. Foner, R. L. Hudson, J. Chem. Phys., 21, 1608 (1953); 32, 1974 (1955).

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

SUBMITTED: June 15, 1961

Fig. 1. Diagram of apparatus. (1) Cylinder with hydrogen; (2) special valve; (3) tube with  $\text{CaCl}_2$ ; (4), (9), and (11) taps; (5) ozonizer tube; (6) nozzle; (7) reaction vessel; (8) manometer; (10) receiver; (12) calibrated vessel for  $\text{O}_2$ ; (13) gas meter for  $\text{O}_2$ ; (14) transformer.

Card 5/45

AVRAMENKO, L.I.; KOLESNIKOVA, R.V.

Photochemical investigation of the mechanism of reaction  
between oxygen atoms and acetaldehyde. Izv. AN SSSR.

Otd.khim.nauk no.7:1231-1234 J1 '61.

(MIRA 14:7)

1. Institut khimicheskoy fiziki AN SSSR.  
(Oxygen) (Acetaldehyde) (Photochemistry)

AVRAMENKO, L.I.; KOLESNIKOVA, R.V.; KUZNETSOVA, N.L.

Rate constant and mechanism of interaction between oxygen atoms and  
1,2-dichloroethane. Izv. AN SSSR. Otd.khim.nauk no.9:1565-1571  
S '61. (MIRA 14:9)

1. Institut khimicheskoy fiziki AN SSSR.  
(Ethane) (Oxygen)

AVRAMENKO, L.I.; KOLESNIKOVA, R.V.

Determination of rate constants of elementary reactions of hydrogen atoms. Report No.1: Rate constants of the recombination  $H + H \rightarrow H_2$  and of the reaction  $H + O_2 \rightarrow HO_2$ . Izv.AN SSSR.Otd.khim.nauk no.11:1971-1976 N '61. (MIRA 14:11)

1. Institut khimicheskoy fiziki AN SSSR.  
(Hydrogen) (Chemical reaction, Rate of)  
(Radicals (Chemistry))

42651

S/062/62/000/011/016/021  
B117/B101

11. 1510  
AUTHORS:

Avramenko, L. I., Euben, N. Ya., Kolesnikova, R. V.,  
Tolkachev, V. A., and Chkheidze, I. I.

TITLE:

EPR study of radicals formed by hydrogen atoms reacting with  
benzene

PERIODICAL:

Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh  
nauk, no. 11, 1962, 2079-2081.

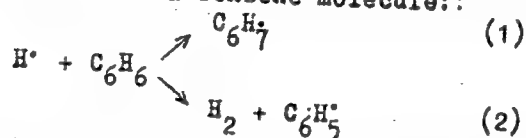
TEXT: The authors analyzed the epr spectra of free radicals formed by  
hydrogen atoms reacting with benzene in the gas phase at 20 and 200°C and  
frozen out with liquid nitrogen. Experimental conditions: silent  
discharge (6000 v, 150 ma), benzene concentration,  $\sim 6 \cdot 10^{14}$  molecules  
per  $\text{cm}^3$ ; hydrogen pressure, 14-15 mm Hg; linear flow rate, 160 cm/sec;  
duration, 12-18 min. The epr spectrum of the radicals formed at 20°C  
by the reaction  $\text{H}^\bullet + \text{C}_6\text{H}_6$  is a triplet with a total splitting of  $93 \pm 5$  oe.  
In addition each component of the triplet is split into four lines at a  
distance of  $10 \pm 1$  oe. This spectrum was identified as the spectrum of

Card 1/2

EPR study of radicals formed...

S/062/62/000/011/016/021  
B117/B101

the  $C_6H_7^{\cdot}$  radical. When the reaction temperature is raised up to  $200^{\circ}C$ , not only the  $C_6H_7^{\cdot}$  radical is formed, but also radicals of another type - obviously  $C_6H_5^{\cdot}$  - which show a singlet. Their relative amount increases as the temperature is raised. Hence the two primary reactions may occur between hydrogen atoms and a benzene molecule::



it is assumed that at room temperature reaction (1) mainly occurs and at higher temperatures reaction (2) takes place. The weak lines detected on the edges of all spectra were attributed to the background, of which the spectrum analysis took no account and which therefore requires a separate investigation. There are 2 figures.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

SUBMITTED: June 15, 1962  
Card 2/2



AVRAMENKO, L.I.; KOLESNIKOVA, R.V.; KUZNETSOVA, N.L.

Rate constant of the reaction of oxygen atoms with ammonia.  
Izv. AN SSSR. <sup>0</sup>td.khim.nauk no.6:983-989 '62. (MIRA 15:8)

1. Institut khimicheskoy fiziki AN SSSR.  
(Oxygen) (Ammonia) (Chemical reaction, Rate of)

S/062/63/000/001/006/025  
B101/B186

AUTHORS: Avramenko, L. I., Kolesnikova, R. V., and Savinova, G. I.

TITLE: Rate constants and mechanism of the reaction of oxygen atoms with ethylene, propylene, and isobutylene

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 1, 1963, 36-45

TEXT: A continuous vacuum apparatus was used for studying the reaction of  $C_2H_4$ ,  $C_3H_6$  and  $i-C_4H_8$  with atomic oxygen produced by high voltage discharge in pure  $O_2$ . The reaction products were condensed with liquid nitrogen and analyzed. Inflammation of the reaction mixture proceeding as chain reaction was prevented by covering the walls of the reaction vessel with KCl so that the quantity of the products formed corresponded to that of the O consumed. Based on the equations derived previously (Izv. AN SSSR, Otd. khim. n. 1962, 983), the constant of the reaction rate was determined from the total aldehydes formed. The constant of the oxygen consumption was determined by measuring the concentration of oxygen atoms, which

Card 1/4

Rate constants and mechanism ...

S/062/63/000/001/006/025  
B101/B186

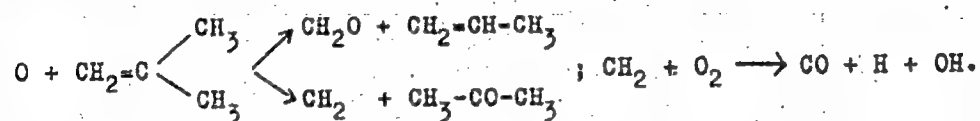
decreases along the reaction vessel. Results: (A) In the reaction with  $C_2H_4$ , the formaldehyde component of the aldehydes formed is 80% at  $50^\circ C$  and more than 90% at  $200^\circ C$ . Moreover, acetaldehyde forms. CO and  $CH_2O$  form in equal quantities. The content of free O atoms decreases linearly along the reaction vessel.  $k_{C_2H_4} = 1 \cdot 10^{-13} \exp(-1350/RT) cm^3 \cdot sec^{-1} \cdot molecules^{-1}$  and the activation energy is  $1350 \pm 500$  cal/mole. (B) In the reaction with  $C_3H_6$ , the  $CH_2O$  component of the carbonyl compounds formed is 70% at  $100^\circ C$ , and 80-85% at  $200^\circ C$ . The second aldehyde forming is acetaldehyde. In addition acetone is formed (in a quantity  $\sim 15\%$  that of the acetaldehyde). CO forms in a larger quantity than acetaldehyde. Consequently not only the  $CH_2$  radical is oxidized to CO as in case A, but also the  $CH_3CH=$  radical is partially oxidized to CO.  $k_{C_3H_6} = 2.85 \cdot 10^{-12} \exp(-3000/RT) cm^3 \cdot sec^{-1} \cdot molecules^{-1}$  and the activation energy is  $3000 \pm 500$  cal/mole. (C) In the reaction with  $i-C_4H_{10}$ , 60-70%

Card 2/4

Rate constants and mechanism ...

S/062/63/000/001/006/025  
B101/B186

of the carbonyl compounds is formaldehyde, the remainder acetone. Additionally, propylene forms in the same quantity as formaldehyde, and CO in the same quantity as acetone. Hence, the following reaction scheme is derived:



The radical  $=\text{C}(\text{CH}_3)_2$  is regrouped completely to propylene.

$k_{i-\text{C}_4\text{H}_8} = 4 \cdot 10^{-12} \exp(-2550/RT) \text{cm}^3 \cdot \text{sec}^{-1} \cdot \text{molecules}^{-1}$  and the activation

energy is 2550 cal/mole. It was confirmed that in the reaction of atomic oxygen with unsaturated hydrocarbons mainly the C=C double bond is split and that carbonyl compounds, predominantly formaldehyde, form. There are 6 figures and 4 tables. The most important English-language references are: H. W. Ford, N. Endow, J. Chem. Phys., 27, 1277 (1957); F. Kaufman, J. Chem. Phys., 28, 352 (1958); L. Elias, H. J. Schiff, Canad. J. Chem., 38, 1657 (1960).

Card 3/4

Rate constants and mechanism ...

S/062/63/000/001/006/025  
B101/B186

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR  
(Institute of Chemical Physics of the Academy of Sciences  
USSR)

SUBMITTED: April 10, 1962

Card 4/4

Avramenko, L.I., Kolesnikova, N.V., and Kuznetsov, N.D.

5/16/63/001/004/004/022

Avramenko, L.I., Kolesnikova, N.V., and Kuznetsov, N.D.

Reaction rate constants and the mechanism of reactions of oxygen atoms with methane and ethane

Academiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 4, 1963, 620-627

The absolute values of the reaction rate constants of oxygen atoms with methane and ethane were measured over the range 10-30°C at reduced pressure. The reaction activation energies of oxygen atoms with methane and ethane were determined to be 7800 and 5200 cal/M, and the pre-exponents equal to  $3.4 \cdot 10^{11}$  and  $1.1 \cdot 10^{11}$  respectively were determined. The two basic directions in the reaction of oxygen atoms with methane are: the first, the formation of  $\text{CH}_3\text{O}$  and  $\text{H}_2$ , the second, the formation of  $\text{CH}_3\text{O}$  and  $\text{H}$ . The basic direction of the reaction of oxygen atoms with ethane is the reaction proceeding with the cleavage of the C-C bond and the formation of  $\text{C}_2\text{H}_5\text{O}$ ,  $\text{H}_2$ , and  $\text{CH}_3$ . There

Avramenko, L. I.; Kolesnikova, R. V.; Savinova, G. I.

The rate constant and the mechanism of reaction of oxygen atoms with

investiya. Disseriya na soiskaniye na uch. stepeni, 1975-1980

reaction of n-butane with oxygen formation of formaldehyde and acetaldehyde

It has been made on the basis of the data on the reaction rate constant of n-butane between temperatures 300-400 K. For the determination of the magnitude of activation energy of the reaction  $\text{C}_4\text{H}_{10} + \text{O} \rightarrow \text{C}_4\text{H}_9 + \text{O}_2$  the pre-exponential factor was found to be  $1.5 \times 10^{10} \text{ l/mol} \cdot \text{s}$  and the activation energy of the reaction  $10.3 \text{ kcal/mol}$ . The results of the reaction mechanism between the products of the reaction and the reaction rate constant are discussed. It is concluded that the reaction of n-butane with oxygen atoms is a free-radical reaction. Orig. art. has. 3 figures, 1 table, 10 formulas.

Card 2/

PC-4/Pr-4 RFL H/L/PS/PM  
S/0062/64/000/011/2090/2091  
AP5000488

Chen, N. Ya.; Kolesnikova, R. V.; Kuznetsova, N. L.; Trofimov, 12

Radicals which form during reaction of atomic hydrogen with acetylene

in USSR. Izvestiya. Seriya khimicheskaya, 11, 1964 2090-2091

acetylene hydrogen reaction  $C_2H_2 + C_2H_2$  hydrogen addition,  
radical

This is a confirmation of an earlier assumption on the formation of

$\begin{array}{c} H & & H \\ & \diagdown & / \\ & C & - C \\ & / & \diagdown \\ H & & H \end{array}$  upon reaction of hydrogen with  $C_2H_2$ . This was confirm-

ing the electron paramagnetic resonance spectrum of the radicals  
and reaction of hydrogen atoms with acetylene in the gaseous phase at  
temperatures of 20 and 280 C and cooled by liquid nitrogen, as well as that of rad-  
icals formed upon the action of H atoms on acetylene cooled to a temperature of



NR: AP5000488

The main reaction product at temperatures below 20 C was an addition of  $C_2H_3$  radical. At higher temperatures, another radical, probably detected in considerable yield. At temperatures of about 300 C the rates of both, addition and removal of hydrogen were about the same. The mechanism had been described earlier and is shortly reviewed. "The authors thank I. I. Chkheidze for evaluating the results." Orig. art. has: 2

ORIGIN: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of  
Physics, Academy of Sciences SSSR)

DATE: 30Mar64

ENCL: 00

SUB CODE: OC, GC

SOV: 003

OTHER: 001

EWG(j)/EWT(m)/EPF(c)/EPR/EWP(j)/EWP(t)/EWP(b) Pc-4/Pr-4/Pa-4  
MR: APS006411 IJP(c)/RPL JD/RM S/0062/55/000/001/0028/0035

Pyramenko, L. I.; Kolesnikova, R. V.; Savinova, G. I.

constants of the speeds of reaction of atomic oxygen with cyclohexane and benzene

USSR. Izvestiya. Seriya khimicheskaya, no. 1, 1969, 26-35

cyclohexane, benzene, cyclic hydrocarbon, oxygen, oxygen compound, compound

constants of the speeds of reaction of atomic oxygen with cyclohexane and benzene were measured and the mechanism of these reactions were examined to clarify the behavior of the atomic oxygen with the aromatic and the

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